

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY


(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

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Applicant's or agent's file reference 47491		FOR FURTHER ACTION		See Form PCT/PEA/416
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International Patent Classification (IPC) or national classification and IPC INV. D21H27/02 D21H27/30 B31F1/07				
Applicant FABIO PERINI S.P.A. et al.				
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 5 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> sent to the applicant and to the International Bureau a total of 8 sheets, as follows:</p> <p><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>				
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the report</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>				
Date of submission of the demand 02.12.2005		Date of completion of this report 11.07.2006		
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465		Authorized officer Naeslund, P Telephone No. +49 89 2399-8614		



**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/IT2005/000114

Box No. I Basis of the report

1. With regard to the **language**, this report is based on
- ☒ the international application in the language in which it was filed
 - ☐ a translation of the international application into , which is the language of a translation furnished for the purposes of:
 - ☐ international search (under Rules 12.3(a) and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4(a))
 - ☐ international preliminary examination (under Rules 55.2(a) and/or 55.3(a))
2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):*

Description, Pages

1-14 as originally filed

Claims, Numbers

1-62 received on 02.12.2005 with letter of 24.11.2005

Drawings, Sheets

1/4-4/4 as originally filed

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):

* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/IT2005/000114

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-62
	No: Claims	NONE
Inventive step (IS)	Yes: Claims	1-62
	No: Claims	NONE
Industrial applicability (IA)	Yes: Claims	1-62
	No: Claims	NONE

2. Citations and explanations (Rule 70.7):

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following documents:

- D1: WO 97/08386 A (KAYSERSBERG; GRAFF, PIERRE) 6 March 1997 (1997-03-06) cited in the application
- D2: US-A-2 502 111 (WALKER CHARLES R) 28 March 1950 (1950-03-28)
- D3: US-A-5 686 168 (LAURENT ET AL) 11 November 1997 (1997-11-11)
- D4: EP-A-0 408 248 (JAMES RIVER CORPORATION OF VIRGINIA) 16 January 1991 (1991-01-16) cited in the application
- D5: US-A-5 736 223 (LAURENT ET AL) 7 April 1998 (1998-04-07) cited in the application
- D6: EP-A-0 426 548 (KAYSERSBERG SA) 8 May 1991 (1991-05-08)
- D7: GB-A-1 245 280 (KIMBERLY-CLARK CORPORATION) 8 September 1971 (1971-09-08)

The document D1 is regarded as being the closest prior art to the subject-matter of claims 1,24 and 54 and shows (see in particular figures 2 and 3 with corresponding parts in the description) a multi-ply web material, comprising three plies joined to one another by gluing.

The subject-matter of claims 1,24 and 54 differs in particular in that said first and second decorative elements are distributed randomly with respect to each other/said first and second embossing units and said first and second path for said first and second ply are arranged such that said first and said second decorative elements are distributed randomly with respect to each other on said first and second ply. This concept is also not known from any of the other documents cited in the international search report. Therefore claims 1,24 and 54 are novel (Article 33(2) PCT).

The problem to be solved by the present invention may be regarded as an alternative way of producing glued embossed multi-ply web material allowing particular and ameliorative aesthetic and technical-functional effects to be obtained with respect to conventional products and where further the decorative elements produced by the

projections on a first ply are less prone to be damaged in the second lamination to which the ply is subjected in a following lamination.

The solution to this problem proposed in claims 1, 24 and 54 of the present application is considered as involving an inventive step (Article 33(3) PCT) for the following reasons: There is no hint seen in the documents cited in the international search report towards an arrangement such that said first and second decorative elements are distributed randomly with respect to each other or where said first and second embossing units and said first and second path for said first and second ply are arranged such that said first and said second decorative elements are distributed randomly with respect to each other on said first and second ply.

The arrangements of the prior art are related to tip- to- tip embossment, embossment of the outer plies in the same embossing unit and/or showing the same pattern in corresponding locations of both the outer plies.

Claims 2-23, 25-53, 55-62 are dependent on claims 1, 24 and 54 respectively and as such also meets the requirements of the PCT with respect to novelty and inventive step.

The industrial applicability would appear evident (Article 33(4) PCT).

EPO -DG 1

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02.12.2005

(PCT/IT2005/000114)
Fabio Perini s.p.a.
Our file 47491+A-WO-11/05

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Amendments under Art. 34 PCT

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Amended CLAIMS

1. A multi-ply web material (N), comprising at least three plies joined to one another by gluing, wherein:

– a first ply (V1) forming a first outer surface of said material has a first pattern composed of first decorative elements (E1) each formed of at least one protuberance (P1) projecting towards the inside of said material and obtained by embossing said first ply (V1), said first decorative elements having a density of no more than 3 elements/cm²;

– a second ply (V2) forming a second outer surface of said material (N) has a second pattern composed of second decorative elements (E2) each formed of at least one protuberance (P3) projecting towards the inside of said material and obtained by embossing said second ply (V2), with a density of no more than 3 elements/cm²;

– at least a third ply (V3) is interposed between said first ply (V1) and said second ply (V2);

– at least a first glue (C1) is applied in areas corresponding to at least some of the protuberances defining said first decorative elements (E1) of the first ply (V1);

– and the first and the second decorative elements are different from each other and are distributed randomly with respect to each other.

2. Material as claimed in claim 1, wherein said first glue (C1) is applied to the third ply (V3) in said areas.

3. Material as claimed in claim 2, wherein said first glue is made to seep at least partly through said third and said first ply and reciprocally glues said third ply (V3) to said first ply (V1) as well as said third ply (V3) to said second ply (V2).

4. Material as claimed in claim 1, wherein a second glue (C2) is applied to the second ply (V2) at the level of at least some of the protuberances defining said second decorative elements (E2).

5. Material as claimed in claim 4, wherein said first glue reciprocally glues the first and the third ply (V1, V3) and said second glue (C2) recip-

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roccally glues said third and said second ply (V3; V2).

6. Material as claimed in one or more of the previous claims, wherein said first ply (V1) has a background embossing (P2).

7. Material as claimed in claim 6, wherein the background emboss-
5 ing of said first ply is composed of protuberances (P2) with a geometrical form, of a height less than the protuberances (P1) forming said first decorative elements (E1).

8. Material as claimed in claim 6 or 7, wherein said background
10 embossing of the first ply has a density equal to or greater than 8 protuberances/cm² and preferably equal to or greater than 15 protuberances/cm².

9. Material as claimed in one or more of the previous claims, wherein said second ply (V2) has a background embossing (P4).

10. Material as claimed in claim 9, wherein the background emboss-
15 ing of said second ply is composed of protuberances (P4) with a geometrical form, of a height less than the protuberances (P3) forming said second decorative elements (E2).

11. Material as claimed in claim 9 or 10, wherein said background
embossing of the second ply has a density equal to or greater than 8 protuberances/cm² and preferably equal to or greater than 15 protuberances/cm².

20 12. Material as claimed in one or more claims 9 to 11, wherein said background embossing of the second ply (v2) is flattened at the level of the protuberances (P1) forming the first decorative elements (E1) on said first ply (V1).

13. Material as claimed in one or more of the previous claims,
25 wherein at least some of the protuberances (P3) defining said second decorative elements (E2) are flattened at the level of the respective protuberances (P1) defining said first decorative elements (E1).

14. Material as claimed in one or more of the previous claims, wherein said third ply (V3) is devoid of embossing.

30 15. Material as claimed in one or more of the previous claims, wherein said third ply (V3) is colored.

16. Material as claimed in one or more of the previous claims, wherein said third ply (V3) has a printed pattern.

17. Material as claimed in one or more of the previous claims,

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wherein one or more of said first, second and third plies are composed of two or more layers (S1, S2).

18. Material as claimed in claim 17, wherein said two or more layers are joined to one another by ply-bonding.

5 19. Material as claimed in claim 17 or 18, wherein at least said third ply is composed of two or more layers.

20. Material as claimed in one or more of the previous claims, wherein said at least one third ply (V3) is glued to the second ply by lamination at the protuberances forming said second decorative elements (E2).

10 21. Material as claimed in one or more of the previous claims, wherein said first and second glue are chromatically different from each other.

22. Material as claimed in one or more of the previous claims, made up in a roll.

15 23. Material as claimed in claim 22, wherein at least the first pattern is composed of decorative elements (E1) symmetrical with respect to a straight line parallel to the axis of the roll (R).

24. Method for the production of a multi-ply web material comprising the phases of:

20 -embossing a first ply (V1) defining a first outer surface of said material forming thereon a first pattern composed of first decorative elements (E1) each formed by at least one protuberance projecting towards the inside of said material, said first elements having a density of no more than 3 elements/cm²;

25 -embossing a second ply (V2) defining a second outer surface of said material forming thereon a pattern composed of second decorative elements (E2) each formed by at least one protuberance projecting towards the inside of said material, said second elements having a density of no more than 3 elements/cm², the first and the second decorative elements differing from each other and being distributed randomly with respect to each other, said
30 first and said second decorative elements being distributed randomly with respect to each other;

-providing at least a third ply (V3) interposed between said first ply (V1) and said second ply (V2);

-applying at least a first glue (C1) in areas corresponding to at least

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some of the protuberances (P1) defining said first decorative elements (E1).

25. Method according to claim 24, wherein said first ply (V1) is embossed in a first embossing unit (3) to form thereon said first pattern and said second ply (V2) is embossed in a second embossing unit (23) to form said
5 second pattern, the embossed second ply being fed from said second embossing unit (23) to said first embossing unit (3) to be joined to said first ply (V1).

26. Method as claimed in claim 24 or 25, wherein said first glue (C1) is applied to the first third ply (V3) at the level of at least some of the protuberances (P1) forming said first decorative elements.
10

27. Method as claimed in claim 26, wherein the first glue is made to seep at least partly between said third and said first ply to reciprocally glue said third ply (V3) to said first ply (V1) as well as said third ply (V3) to said second ply (V2).

15 28. Method as claimed in claim 24 or 25, wherein said first glue (C1) is applied to the first ply (V1) at the level of at least some of the protuberances (P1) forming said first decorative elements (E1).

29. Method as claimed in claim 24 or 25, wherein a second glue (C2) is applied to the second ply at the level of at least some of the protuberances (P3) defining said second decorative elements (E2).
20

30. Method as claimed in claim 28 and 29, wherein said first glue (C1) reciprocally glues the first and the third ply (V1, V3) and said second glue (C2) reciprocally glues said third and said second ply (V3; V2).

31. Method as claimed in one or more of claims 24 to 31, wherein
25 said first ply (V1) is embossed between a first pressure roller (7) and a first embossing cylinder (5) having projections (5P) corresponding to the protuberances (P1) forming said first decorative elements (E1), and said second ply (V2) is joined to said first ply (V1) laminating said first ply (V1) and said second ply (V2) between the first embossing cylinder (5) and a first laminating roller (9), with said at least one third ply (V3) interposed between the first and
30 the second ply.

32. Method as claimed in claim 31, wherein said first glue (C1) is applied to at least some of the protuberances (P1) produced on said first ply (V1) when it is engaged with the first embossing cylinder (5) and wherein said

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second and third ply (V2, V3), previously glued to each other at the level of at least some of the second decorative elements (E2), are placed on the first ply (V1) and laminated therewith between the first embossing cylinder (5) and the first laminating roller (9) after application of the first glue (C1).

5 33. Method as claimed in one or more of claims 24 to 32, wherein said first ply is previously embossed with a background pattern (P2).

 34. Method as claimed in claim 33, wherein said background pattern is flattened at the level of said first decorative elements.

 35. Method as claimed in one or more of claims 24 to 34, wherein
10 said second ply (V2) is embossed between a second pressure roller (27) and a second embossing cylinder (25) with projections (25P) corresponding to the protuberances (P3) forming said second decorative elements (E2), and said second ply (V2) is joined to said third ply (V3) laminating said second ply (V2) and said third ply (V3) between the second embossing cylinder (25) and a
15 second laminating roller (29), said second embossing cylinder and said second laminating roller being disposed upstream of the first embossing cylinder and of the first laminating roller.

 36. Method as claimed in claim 35, wherein said second glue (C2) is applied to the protuberances (P3) produced on said second ply (V2) when it is
20 engaged with the second embossing cylinder (25), said third ply (V3) being placed on the second ply (V2) after application of the second glue (C2) and laminated with the second ply (V2) between the second embossing cylinder (25) and the second laminating roller (29).

 37. Method as claimed in claim 35 or 36, wherein said second ply is
25 previously embossed with a background pattern (P4).

 38. Method as claimed in claim 37, wherein said background pattern (P4) on the second ply (V2) is flattened at the level of said second decorative elements (E2) when the second ply (V2) is embossed with said second decorative elements (E2).

30 39. Method as claimed at least in claim 33, wherein the background embossing (P2) of said first ply (V1) is composed of protuberances (P2) with a geometrical form, of a height less than the protuberances (P1) forming said second decorative elements (E2).

 40. Method as claimed in claim 33 or 39, wherein said background

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embossing (P2) of the first ply (V1) has a density equal to or greater than 8 protuberances/cm² and preferably equal to or greater than 15 protuberances/cm².

41. Method as claimed in claim 37 or 38, wherein the background embossing of said second ply is composed of protuberances with a geometrical form, of a height less than the protuberances forming said second decorative elements.

42. Method as claimed in claim 41, wherein said background embossing of the first ply (V1) has a density equal to or greater than 8 protuberances/cm² and preferably equal to or greater than 15 protuberances/cm².

43. Method as claimed in claim 41 or 42, wherein said background embossing (P4) of the second ply (V2) is flattened at the level of the protuberances (P1) forming the first decorative elements (E1) on said first ply (V1) when the first ply (V1), the second ply (V2) and the third ply (V3) are joined to one another.

44. Method as claimed in one or more of claims 24 to 43, wherein said third ply (V3) is devoid of embossing.

45. Method as claimed in one or more of claims 24 to 44, wherein said third ply (V3) is printed.

46. Method as claimed in one or more of claims 24 to 45, wherein one or more of said first, second and third plies are formed of two or more layers.

47. Method as claimed in claim 46, wherein said two or more layers are joined to one another by ply-bonding.

48. Method as claimed in claim 46 or 47, wherein at least said third ply is composed of two or more layers.

49. Method as claimed in one or more of claims 24 to 48, wherein said first and second glue are chromatically different from each other.

50. Method as claimed in one or more of claims 24 to 49, wherein said material is made up in a roll (R).

51. Method as claimed in claim 50, wherein at least the first pattern (E1) is composed of designs symmetrical with respect to a straight line parallel to the axis of the roll.

52. Method as claimed in one or more of claims 24 to 51, wherein

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said third ply is colored.

53. Method as claimed in one or more of claims 24 to 52, wherein said protuberances (P3) forming the second decorative elements (E2) on the second ply (V2) are at least partly flattened at the level of the protuberances (P1) forming the first decorative elements (E1).

54. Device for the production of embossed multi-ply web material, comprising:

— a first embossing-laminating unit (3) comprising a first embossing cylinder (5) equipped with first projections (5P) defining a first pattern for generating first decorative elements on a first ply (V1), a first pressure roller (7) cooperating with said first embossing cylinder (5), a first laminating roller (9) and a first glue dispenser (11) disposed between said first pressure roller (7) and said first laminating roller (9);

— an embossing unit comprising at least a second embossing cylinder (25) equipped with second projections (25P) defining a second pattern for generating second decorative elements (E2) on a second ply (V2), and a second pressure roller (27) cooperating with said second embossing cylinder (25);

— a first path (P1) for at least a first ply (V1) towards and through said first embossing-laminating unit (3);

— a second path (P2) for at least a second ply (V2) towards and through said second embossing unit (23);

— a third path (P3) for said third ply (V3);

— said first and second embossing units and said first and second path for said first and second ply are arranged such that said first and said second decorative elements are distributed randomly with respect to each other on said first and second ply.

55. Device as claimed in claim 54, wherein said embossing unit is a second embossing-laminating unit (23) and comprises: a second laminating roller (29) cooperating with said second embossing cylinder; and a second glue dispenser (31) disposed between said second pressure roller and said second laminating roller.

56. Device as claimed in claim 55, wherein said third path for the third ply extends towards and through said second embossing-laminating unit

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(23).

57. Device as claimed in claim 54, 55, 56, comprising along said first path (P1) a first secondary embossing unit (13) to produce a background embossing (P2) on said first ply (V1).

5 58. Device as claimed in one or more of claims 54 to 57, comprising along said second path (P2) a second secondary embossing unit (33) to produce a background embossing (P4) on said second ply (V2).

59. Device as claimed in one or more of claims 54 to 57, comprising a printing unit (41).

10 60. Device as claimed in claim 59, wherein said printing unit (41) is positioned along said third path (P3).

61. Device as claimed in one or more of claims 54 to 60, comprising a ply-bonding unit (51).

15 62. Device as claimed in claim 61, wherein said ply-bonding unit is disposed along said third path (P3).